

What is claimed is:

1. (once amended) A process for the preparation of an MR contrast agent comprising:
 - 5 i) obtaining a solution in a solvent of a hydrogenatable, unsaturated substrate compound and a catalyst for the hydrogenation of said substrate compound; and
 - 10 ii) introducing said solution in droplet form into a chamber containing hydrogen gas (H_2) enriched in para-hydrogen ($p\text{-}^1H_2$) and/or ortho-deuterium ($o\text{-}^2H_2$) to hydrogenate said substrate to form a hydrogenated imaging agent.
2. (once amended) The process of claim 14 wherein said field strength in step (iii) is less than 50 μT .
3. (once amended) The process of claim 14 wherein said field strength in step (iii) is less than 1 μT .
- 20 4. (once amended) The process of claim 14 wherein said field strength in step (iii) is less than or equal to 0.1 μT .
5. (once amended) The process of claim 14 wherein said field strength in step (iii) is cycled in a first part from earth's ambient field strength to a field strength less than 0.1 μT , and in a second part back to ambient field strength again.
- 25 6. (once amended) The process of claim 5 wherein the first part of the cycle is approximately ≤ 1 ms and the second part is approximately 10-10000 ms.
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7. (once amended) The process of claim 1 wherein said process is carried out directly in water and wherein both said substrate and said catalyst are water-soluble.

8. A hydrogenation apparatus comprising a hydrogenation chamber having a liquid outlet into a conduit leading to a liquid droplet generator inlet to a solvent removal chamber,
said hydrogenation chamber having a hydrogen inlet and a solution inlet provided with a further liquid droplet generator,
said conduit including a catalyst removal chamber between said hydrogenation chamber and said solvent removal chamber and being provided with a liquid inlet, said solvent removal chamber being provided with a gas outlet and with a liquid outlet.

9. (once amended) The apparatus of claim 8 wherein said hydrogenation apparatus is further provided with magnetic shielding such that the magnetic field within at least part of said hydrogenation chamber and/or within at least part of said conduit is $<50 \mu\text{T}$.

10. (once amended) The apparatus of claim 9 wherein said magnetic field is $<1 \mu\text{T}$.

11. (once amended) The apparatus of claim 9 wherein said magnetic field is $<0.1 \mu\text{T}$.

12. (once amended) The apparatus of claim 8 wherein said conduit is provided with a liquid inlet between said hydrogenation chamber and said catalyst removal chamber.

14. (new) The process of claim 1 further comprising subjecting said hydrogenated imaging agent to a magnetic field having a field strength at or below the ambient magnetic field strength of the earth.

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15. (new) The process of claim 1 further comprising dissolving said imaging agent in an aqueous medium.

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16. (new) The process of claim 14 further comprising separating said catalyst from said solution of imaging agent in aqueous medium.

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17. (new) The process of claim 14 further comprising separating said solvent from said solution of imaging agent in aqueous medium.

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18. (new) The process of claim 14 further comprising freezing solution of imaging agent in aqueous medium.